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Delivery at the CGIAR: Evidence of Historical Impact

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CGIAR

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INTRODUCTION

For 70% of the world's rural poor, agriculture is the primary source of income and employment.[1] Sustainable agricultural development is therefore the primary economic mode for alleviating poverty. As the world's leading agricultural research institution, the CGIAR has generated the technology and practices that have spurred agricultural development and reduced rural poverty.

Unfortunately, the delivery of this technology has varied within regions that have experienced significant overall gains and in particular, Sub-Saharan Africa. As of 2000, farmers had planted only 18.5% of agricultural land in Sub-Saharan Africa with improved seed varieties, compared with 50.2% in Asia and 41.0% in Latin America.[2] Fertilizer use in East Asia & the Pacific (322.0 kg/ha of arable land) and Latin America & the Caribbean (107.0 kg/ha) dwarfs use in Sub-Saharan Africa (11.5 kg/ha).[3] In addition, farmers in Sub-Saharan Africa employ sustainable land management practices on less than 3% (5 million ha) of total cropland on the continent.[4]

The CGIAR could play the lead role in disseminating the latest research to the rest of the developing world that has yet to adopt modern agricultural technology and practices. In fact, the CGIAR has previously succeeded in combining dissemination with its research, and several cases, outlined below, illustrate the widespread impact that the CGIAR's research activities have had. Based on a critical examination of the CGIAR's successes, this paper recommends that the CGIAR increase its investment and formal commitment to dissemination of its research and proposes several questions for discussion on the most effective ways for the CGIAR to accomplish this goal.

DROUGHT TOLERANT MAIZE FOR AFRICA[5]

In Sub-Saharan Africa, 300 million people depend on maize for daily subsistence, and nearly all farmers in the region rely on rainfall to grow maize. Consequently, droughts in the region can have a devastating effect on maize yields. For example, in 2011, a drought in the Horn of Africa affected over 12.5 million people, and experts expect climate change to increase the incidence and severity of drought on the continent.

[1] http://data.worldbank.org/topic/agriculture-and-rural-development
[2] http://www.brookings.edu/~/media/events/2011/1/13%20agricultural%20productivity%20africa/africa%20growth%20forum_web.pdf
[3] http://databank.worldbank.org/data/views/variableSelection/selectvariables.aspx?source=world-development-indicators
[4] http://www.fao.org/docrep/014/i1861e/i1861e04.pdf
[5] http://dtma.cimmyt.org/index.php/about/background

Launched in 2006, the Drought Tolerant Maize for Africa ("DTMA") project mitigates the risk of drought's effects on maize farming by using conventional breeding to develop and disseminate improved seed varieties. Under normal precipitation conditions, these varieties match or exceed the yields of the most popular commercial varieties, but under reduced rainfall, these varieties can still provide an adequate harvest. In addition to drought tolerance, the project adapts the maize varieties for local conditions.

For the DTMA project, CIMMYT and IITA coordinated their work with publicly funded research organizations, public and private seed producers, varietal certification agencies and farmer groups in 13 countries who have access to 34 drought tolerant varieties of seed. In addition, DTMA coordinates capacity-building events for maize breeders, technicians, seed company owners and employees, extension workers, non-governmental organizations and farmer groups. Finally, DTMA organizes seed policy workshops to foster competitive markets and increase market access.

The DTMA project has already benefited over two million smallholder farmers and increased yields by 20-30% relative to other commercially available varieties under moderate drought conditions. The current phase of DTMA that runs through 2016 will provide for enough incremental maize to benefit 30-40 million people and generate annual economic benefits of $160-200 million in drought affected areas.

SCUBA RICE IN SOUTH ASIA[6]

In Asia, rice is dominant in many rural areas where it is the only crop that farmers can grow during the wet season. However, flooding in the coastal deltas of India and Bangladesh destroy four million tons of rice each year. In order to combat the effects of severe flooding, IRRI scientists developed rice varieties that exhibit tolerance to submergence for up to 17 days. IRRI senior scientist Dr. David Mackill identified the Sub1 gene and consequently developed Sub1 varieties of rice that are resilient to flooding ("scuba rice"). In 2009, IRRI released Swarna-Sub1, which is the first submergence-tolerant, high-yielding rice variety in India.

Previously, IRRI only provided and field-tested rice varieties that were tolerant of flooding, but field-testing for a rice variety typically requires four to five years prior to its release and an additional two to three years before it reaches end users. In order to expedite this process, IRRI assisted government agencies and private seed companies to multiply and distribute seeds to farmers. In addition, IRRI is assisting state governments in India to identify specific flood-prone areas where seeds of the submergence-tolerant variety can be distributed without enduring production delays. IRRI is leading this initiative through the Stress-Tolerant Rice for Poor Farmers in Africa and South Asia project, funded by the Bill & Melinda Gates Foundation.

In India, farmers have planted scuba rice on 12 million hectares of farmland in flood-prone areas as a result of faster seed multiplication, targeted dissemination and the linking of external partners. To date, 70,000 IRRI minikits (5kg packets of seeds) have been distributed to more than 100,000 farmers. By adopting scuba rice, these farmers can grow enough incremental rice to feed 30 million people.

[6] http://www.cgiar.org/consortium-news/scuba-rice-the-makings-of-a-runaway-success-story/

CONSERVATION AGRICULTURE IN CENTRAL ASIA[7][8]

Conservation agriculture enables farmers to sustainably intensify production, improve soil health and minimize negative externalities. However, these practices are not widespread in most Central Asian countries. Within the region, Kazakhstan is the only country that has actively embraced conservation agriculture.

With the support of CIMMYT and other international organizations and donors, Kazakhstan began adopting conservation agriculture practices in 2000. By 2012, farmers in three northern regions of the country had adopted the "no-till" method, accounting for 1.85 million hectares or 10% of all of Kazakh farmland. Conservation agriculture's "no-till" method has generated 30-40% yield increases, reducing production costs and soil erosion. Kazakhstan is now the world's second fastest global adopter of conservation agriculture after China, and the adoption of the "no-till" method has increased domestic wheat production by almost 2 million tons, equating to $0.6 billion in economic gains between 2010 and 2012, providing enough incremental grain to feed nearly 5 million people and sequestering 1.8 million additional tons of CO2 per year.

ANALYSIS OF DELIVERY AT THE CGIAR

Each of the examples above shows how the CGIAR has successfully combined its research activities with an explicit commitment to deliver its findings to the field for immediate and direct impact. Starting with an agricultural development challenge facing a region, a CGIAR Center establishes a program with the goal to not only develop promising technology through scientific research but also to commercialize its research findings for immediate dissemination to the end user. As a result, in these cases, the CGIAR's research produced significant economic benefits, improved food security and alleviated rural poverty.

In order for its research to achieve impact in the field, the CGIAR currently disseminates its findings to end users through its network of external partners, including national and regional research institutes, civil society organizations, academia and the private sector.[9] The CGIAR often works hand-in-hand with these external partners and stakeholders to conduct its research activities and eventually deliver new technologies and practices to the end user. Consequently, dissemination at the CGIAR remains ad hoc, and the degree to which the CGIAR's research transfers to the field varies across projects. Although the CGIAR has enjoyed considerable success in creating impact, delivery represents an important component of the research process and a critical examination of its function within the CGIAR system is required to maximize the impact of the CGIAR's activities.

QUESTIONS FOR DISCUSSION

Based on the examples and commentary provided above, several questions for discussion are proposed to better understand the role of delivery at the CGIAR:

[7] http://www.worldbank.org/en/results/2013/08/08/no-till-climate-smart-agriculture-solution-for-kazakhstan
[8] http://blog.cimmyt.org/?p=10333
[9] http://impact.cgiar.org/pdf/100.pdf

1. How can the CGIAR better deliver its research to the field and what model(s) should it employ?
2. Should the CGIAR focus only on research and continue to rely on external partners for delivery?
3. How could the CGIAR employ a more systematic strategy for delivery of its research through either external partners or internally across the organization?
4. How should the CGIAR fund initiatives related to delivery?
5. What entity should administer the CGIAR's delivery initiatives?
6. Does incorporating delivery require a reorganization of the CGIAR's structure or strategy?
7. How should CGIAR measure and be accountable for its impact on delivery?
8. Should the CGIAR modify its planning and fund allocation process to incorporate delivery?
9. What is the potential for donors to the CGIAR to better link with and exploit CGIAR R&D activities and products in their bilateral national/regional rural development programs and investments? How could this be made more systematic, institutionalized, and less ad hoc and opportunistic?

CONCLUSION

The CGIAR has produced significant impact in developing regions when it has paired its strength in scientific research with dissemination of the technology and practices derived from its activities to end users in the field. However, delivery at the CGIAR today remains ad hoc and opportunistic, depending on external partners. Several examples and questions have been posed by this paper to better understand what the role of delivery should be at the CGIAR.